Effect of Social Class and Area of Domicile on the Prevalence of Intestinal Helminthiasis in Nursery and Primary School Children in Enugu

By

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SUMMARY

Objective: The primary objective of the study was to determine the effect of social class and area of domicile on the prevalence of helminthiasis in nursery and primary school children in Enugu.

Subjects and method: This was a cross-sectional study in which stool samples were obtained from 460 nursery and primary school children from different social classes and different areas of domicile and analysed for intestinal helminthiasis using the Kato Katz method.

Results: One hundred and sixty-six (36.1%) of the 460 children studied lived in the urban area; 215 (46.7%) lived in the semi-urban area and 79 (17.2%) lived in the urban slum area. The prevalence of intestinal helminthic infection was lowest in children living in urban areas (10.2%) and highest in those in urban slums (48.4%). There was a significant relationship between residential abode or area of domicile and prevalence of helminthic infection ($\chi^2 = 59.54$; df = 2; p = 0.001).

The prevalence of intestinal helminthic infection was highest in the lower class (50.9%), lowest in the upper class (9.7%) and intermediate in the middle class (21.7%). This trend was statistically significant ($\chi^2 = 65.06$; df = 2; p = 0.001).

Conclusion: It is concluded that the prevalence of intestinal helminthiasis is affected by both areas of domicile and social class of children. Hence, intervention by the government to create better areas of domicile and to improve the social class of its populace will reduce the prevalence of intestinal helminthiasis.

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INTRODUCTION

Several authors have documented high prevalence of helminthiasis in Nigeria[1, 2, 3]. The high prevalence of these infections in communities is closely related to poverty, ignorance and poor environmental hygiene[4]. Helminths play an important role as contributory factors in the aetiology of childhood malnutrition because heavy chronic infection may aggravate or precipitate malnutrition[5]. The prevalence of helminthiasis has been documented by authors in our environment to be affected by the social class of the parents of children[6]. However, there is scanty information in the literature on the effect of area of domicile on helminthiasis in our environment. This study was therefore necessary to know if there is any effect of the area of domicile and social class on the prevalence of helminthiasis among children in Enugu. Current information on the effect of the area of domicile on the prevalence of helminthiasis will help in the global plan for the control of helminthiasis.

PATIENTS AND METHOD

This work was done by the researchers using the facility at the research laboratory of the Federal Ministry Of Health, National Arbovirus and Vector Research Centre, which is situated at the Government Reserved Area in Enugu. Fresh Stool samples were collected from nursery and primary school children residing in the urban, semi-urban and urban slum areas of Enugu and these fresh stool samples were analyzed for the presence of ova of Helminths by trained laboratory scientists using the Kato Katz method. Enugu is the capital of Enugu State, which lies in the south-eastern part of Nigeria.

One hundred and fourteen and 386 children attending various nursery and primary schools respectively in Enugu were involved in this study between the months of August and September, 2003. These pupils were selected via the multi-stage sampling method after getting consent of their parents or guardians as well as assent from older children. The areas of domicile of these children were their actual place of residence as at the time of the study and not the location of their schools. The sample size was got using a standard formula[7] and using the prevalence documented previously in a study conducted in Enugu[2]. The nursery and primary schools in Enugu were grouped into those from urban, semi-urban and urban slum areas as shown in Tables 1 and 2.

Table 1

Distribution of nursery schools in the urban, semi-urban and urban slum areas of Enugu

	Urban	Semi-urban	Urban slum	Total
No. of nursery schools	32	26	15	73
Population of nursery pupils	6,416	5,120	1,200	12,736
Proportion of nursery school pupils	0.50	0.40	0.10	1
No. of pupils selected	57	46	11	114

Table 2

Distribution of primary schools based on their different locations within Enugu

	Urban	Semi-urban	Urban slum	Total
No. of primary schools	57	54	28	139
Population of primary school pupils in each location	18,731	17,793	6,873	43,397
Proportion of primary school population	0.43	0.41	0.16	1
No. of primary school pupils selected	166	158	62	386

Out of the 500 children that were recruited for the study, only 460 children completed the study

Social class

The children studied were from different socio-economic classes. The social classes of the children were determined using the parents' social class classification as documented by Olusanya et al[8] which is shown below:

A

Scores **Father's occupation**

1 Professionals, Top civil Servants, Business executives and Politicians
2 Middle level Bureaucrats, Technicians, Skilled Artisans and well-to-do traders
3 Unskilled workers and those in general whose income is at or below the national minimum wage

B

Scores **Mother's level of education**

0 Education up to University level
1 Secondary or Tertiary below University (e.g. College of Education, School of Nursing)
2 No schooling or up to Primary level only

Adding scores from A and B above gave the social class of the subject.

Social class 1 or upper class: Score 1 or 2
Social class 2 or middle class: Score 3
Social class 3 or lower class: Score 4 or 5

After documenting the social class of the children and their area of domicile, they were given properly labelled, clean, unbranded containers for collection of their stool samples which were collected and submitted the next morning. The stool samples were immediately examined at the research laboratory of the Federal Ministry of Health, Enugu using the Kato Katz method. Diagnosis of intestinal helminthiasis was based on the examination of 50 microgram of Kato smear of faeces[9]. Helminthic ova were identified based on characteristic morphological features of helminthic ova[10].

Statistical analysis

Data were analysed for statistical differences in the prevalence of helminthic infection according to social classes and various areas of domicile. Probability value of < 0.05 was considered significant[11].

RESULTS

One hundred and sixty-six (36.1%) of the 460 children studied lived in urban areas, 215 (46.7%) lived in semi-urban areas and 79 (17.2%) lived in urban slum areas as shown in Table iii.

Table 3
Occurrence of helminthiasis among children in relation to their areas of domicile in Enugu

Residential area	Total no. of children	No. (%) of children infected
Urban	166	17 (10.2)
Semi-urban	215	95 (44.2)
Urban slum	79	38 (48.1)
Total	460	150 (32.6)

X2 = 59.24; df = 2; p = 0.001

The prevalence of helminthic infection was lowest in children living in urban areas (10.2%) and highest in those living in the urban slums (48.1%). There was a significant relationship between area of domicile and prevalence of intestinal helminthiasis ($\chi^2 = 59.24$; df = 2; p = 0.001).

Table 4 shows the distribution of the children by social class and prevalence of intestinal Helminthiasis. Two hundred and

fourteen (46.5%) were from the lower social class and the prevalence of helminthic infection was highest among these (50.9%). The trend was statistically significant (X^2 = 65.06; df = 2; p = 0.001).

Table 4

Social classes of children and prevalence of intestinal helminthiasis

Social class	Total no. Of children studied(%)	No. of children infected (%)
Upper class	103 (22.4)	10 (9.7)
Middle class	143 (31.1)	31 (21.7)
Lower class	214 (46.5)	109 (50.9)
Total	460 (100)	150 (32.6)

X2 = 65.06; df = 2; p = 0.001

When prevalence of helminthic infection in the upper social class was compared to that in the middle social class, the difference was statistically significant (X^2 = 6.18; df = 1; p = 0.01). Comparing the prevalence of helminthic infection in the upper social class to that in the lower social class also showed a significant difference (X^2 = 50.40; df = 2; p < 0.0001).

Also, the rate of infection in the middle social class when compared to that in the lower social class showed a significant statistical difference (X^2 = 30.78; df = 1; p = 0.001).

DISCUSSION

Intestinal helminthiasis has been shown to be very common in the tropics[2; 3.This] has been shown to be due to various factors which are peculiar to the tropical environment[4]. Much of our environment is characterized with areas of very poor hygienic standard. Some of these areas are found in our urban environment and are commonly addressed as the urban-slums. It is very clear that intestinal helminthiasis thrive more in such dirty environment. This is collaborated in this study which showed that the greater percentage of children from the urban slums was infected with helminths when compared to children living in the semi-urban and urban areas. This finding is not surprising since urban slum areas are noted for poor hygiene with indiscriminate refuse dumps and poor sanitary facilities. Thus, children living in such unhygienic environment as found in the urban slums are likely to be helminth-infected compared with those children who live in areas with better sanitary conditions as mostly found in the urban and semi-urban areas. This finding collaborates with those of other authors[3, 6, 12, and 13].

Higher infection rate was recorded in children from the lower social class when compared to those children drawn from the middle and upper social classes. These findings are in agreement with those of some other authors[14] who observed that the prevalence of intestinal helminthiasis is related to family socio-economic status with the lowest rate being found in the highest social class. Children who are of the lower social class are likely to be the ones whose parents cannot afford the luxury of living in well planned and clean areas like the urban areas. They are therefore more likely to be exposed to helminthic infection which thrives better where poverty and poor sanitary habits prevail.

Conclusion: This study concludes that intestinal helminths infestation is still widespread among school children in Enugu. Area of domicile and social class significantly influence the epidemiology of intestinal Helminthiasis.

Interventions that economically empower the populace are suggested as means of improving both the economic status/social class and improved environmental conditions would reduce the prevalence of

intestinal Helminthiasis. Health Education remains an indispensable tool to achieve a helminthiasis-free population.

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